

REMARKS

Claims 1, 3-6, 8, 9, 11-14, and 16-20 are presently pending in the application, with independent claims 1, 6, 9, and 14 being amended for clarity. Support for the claim amendment is found in the description on page 6, line 20 to page 8, line 9, and particularly by the description "... a large temperature gradient is formed in the reaction vessel 102" on page 7, lines 11 and 12, and the description "... a difference in temperature between regions of reaction vessel is made" on page 9, lines 7 and 8, etc.

It is noted that Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1, 3-6, 8, 9, 11-14, and 16-20 stand rejected under 35 USC §103(a) as unpatentable over Okase.

Applicants again respectfully disagree and submit that the rejection of record fails to meet the initial burden of a *prima facie* rejection.

THE CLAIMED INVENTION

As described in, for example independent claim 1, the present invention is directed to semiconductor film formation device. A reaction vessel includes a gas flow path to allow a source gas to pass through, and a substrate mount site upon which to mount a substrate is provided in the gas flow path inside the reaction vessel along a side thereof and located along a first side of the reaction vessel. A heater is disposed along only a single side of said reaction vessel, outside of the reaction vessel on the first side of the reaction vessel along which is located the substrate mount site inside the reaction vessel. A cooling device is disposed along only a single side of the reaction vessel, outside of the reaction vessel on a second side of the reaction vessel. The second side is substantially directly opposite to first side of the reaction vessel where the heater is located. The cooling device controls an internal temperature of the reaction vessel in a first section of the gas flow path where the substrate mount site is located.

A thermal conductivity adjusting member is disposed between the reaction vessel and

the cooling device. The thermal conductivity adjusting member allows the first section along the gas flow path where the substrate mount is located to have a thermal conductivity different from that of a second section along the gas flow path, in order to lower a thermal diffusion effect of the source gas in the first section. Thereby, a temperature gradient in the reaction vessel is formed by providing a difference in temperature between regions of the reaction vessel

In another aspect of the present invention, a semiconductor film formation device as described in, for example claim 6, includes a semiconductor film formation device including a reaction vessel that includes a gas flow path to allow a source gas to pass through and a substrate mount site on a side surface of the reaction vessel to mount a substrate in the gas flow path. The substrate mount site is on a first side of the reaction vessel.

A heater is disposed along only one side of the reaction vessel, outside of the reaction vessel on the same side of the reaction vessel as the substrate mount site is located (e.g., the first side), the heater thereby being close to the substrate mount site. A cooling device controls an internal temperature of the reaction vessel in a section of the gas flow path wherein the substrate mount site is located, the cooling device being disposed along only one side of the reaction vessel, outside of the reaction vessel on a second side of the reaction vessel that is substantially directly opposite to first side of the vessel where the heater is located.

A wall thickness of the reaction vessel is smaller in the section along the gas flow path where the substrate mount site is located, thereby forming an interspace between the reaction vessel and the cooling device to lower a thermal diffusion effect of the source gas in the section of the gas flow at the location of the substrate mount site.

The prior art of record fails to satisfy the plain meaning of the description of even these independent claims, as that the language would be interpreted by one having ordinary skill in the art.

THE PRIOR ART REJECTIONS

The Examiner continues to allege that Okase renders obvious the present invention defined by claims 1, 3-6, 8, 9, 11-14, and 16, as shown in Figure 7.

The present invention is characterized by that a temperature gradient is formed in the reaction vessel by providing a difference in temperature between regions of the reaction vessel. Namely, a temperature distribution in the reaction vessel is controlled to be non-uniform.

According to this structure, a semiconductor film having uniform thickness and composition ratio can be obtained. This effect was first discovered by the present inventors.

In contrast, Okase discloses a heat treatment apparatus in which a workpiece is heated with an equal temperature distribution and high repeatability on its entire surface. The object of Okasa is to provide a heat treatment apparatus for heat treating the workpiece with an equal temperature distribution. Another object of Okase is to provide a heat treatment apparatus for causing the temperature distribution and the concentration of a process gas to be equal on the entire surface.

Accordingly, Okase fails to disclose or to suggest that the temperature distribution is controlled to be non-uniform. Okase rather discloses a technical idea completely opposite to that of the present invention. Therefore, Okase teaches away from that the temperature gradient is formed in the reaction vessel.

As described above, it would not have been obvious for those skilled in the art to provide the inventions according to the amended claims 1, 6, 9, and 14 from Okase. Claims 3-5, 8, 11-13, and 16-20 directly or indirectly depend from claims 1, 6, 8, and 14, so that these dependent claims would also be allowable.

However, Applicant also submits that, as previously described by Applicant, Okase fails to satisfy the plain meaning of the claim language as would be acceptable to one having ordinary skill in the art, thereby failing to meet the initial burden of a *prima facie* rejection.

Finally, Applicant submits that the deficiencies of Okase conceded by the Examiner on page 13 of the Office Action are not obvious in any way from Okase, since, as discussed above, the object of Okase is to equalize temperature distribution, as clearly described at lines 61-64 of column 1. To modify the structure in the manner proposed by the Examiner (e.g., to have a heater and a cooling device on respective single sides of the vessel) would clearly defeat this purpose and would be, therefore, improper under the holding of *In re Gordon*, 733

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F.2d 900, 221 USPQ 1125 (Fed Cir 1984), as described in MPEP §2143.01: *"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification."*

Therefore, the present invention is clearly patentable over Okase and the Examiner is respectfully requested to reconsider and withdraw this rejection.

CONCLUSION

In view of the foregoing, Applicant submits that claims 1, 3-6, 8, 9, 11-14, and 16, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated.

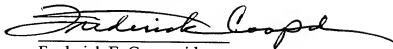
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary for allowance in a telephonic or personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136.

The Commissioner is authorized to charge any deficiency in fees, including extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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